

Message Text

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ACTION OES-06

INFO OCT-01 EUR-12 EA-09 ISO-00 ACDA-10 COME-00 FEA-01
CIAE-00 INR-07 IO-13 L-03 NSAE-00 NSC-05 EB-08
NRC-07 DODE-00 TRSE-00 /082 W
-----251204Z 100239 /11

O R 251144Z MAR 77
FM AMEMBASSY PARIS
TO ERDA WASHDC IMMEDIATE
INFO SECSTATE WASHDC 1019
AMEMBASSY BONN
AMEMBASSY LONDON
AMEMBASSY TOKYO
USMISSION EC BRUSSELS

UNCLAS SECTION 01 OF 02 PARIS 08797

ERDA FOR A.N. TARDIFF/AIA

E.O. 11652: N/A
TAGS: TECH, ENRG, FR
SUBJECT: LMFBR/LWR POWER COSTS

REF: A) STATE 059863, B) 3/24 TELCON FROM A.N. TARDIFF

1. SUMMARY. THE FRENCH EXPECT THAT COMMERCIAL LMFBR'S WILL BE ECONOMICALLY COMPETITIVE WITH LWR'S AT URANIUM PRICES OF \$50 PER KG, MORE DEFINITELY SO AT HIGHER URANIUM PRICES. AVAILABLE FRENCH POWER COSTS PROJECTION FOR COMMERCIAL LWR'S ORDERED IN 1976 AND OPERATIONAL IN 1982-83 IS ABOUT 0.08 IN 1976 FRANCS PER KW HOUR (OR 1.8 CENTS PER KW HOUR AT 4.5 FRANCS PER DOLLAR). COMPARATIVE POWER COST FROM A COMMERCIAL LMFBR TO BE ORDERED AND GO ON LINE AT ABOUT THE SAME TIME WOULD ALSO BY 0.08 FRANCS PER KW HOUR. (HOWEVER, REAL COMMERCIALIZATION OF THE BREEDER WITH A FEW LARGE PLANTS COMPLETED AND SEVERAL OTHERS ON ORDER WOULD NOT
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BE ACHIEVED TILL ABOUT 1990 AT THE EARLIEST.) MANY ASSUMPTIONS ENTER INTO ANY LONG-RANGE COST PROJECTIONS OF THIS TYPE; HOWEVER, BASICALLY CEA STAFF ESTIMATE THAT CAPITAL COSTS OF COMMERCIAL LMFBR'S WOULD BE NOT MORE THAN ABOUT 30 PERCENT HIGHER, OPERATING COSTS SLIGHTLY LESS, AND FUEL CYCLE COSTS ABOUT 50 PERCENT LOWER THAN FOR EQUIVALENT LWR'S. END SUMMARY.

2. THE AVAILABLE COMPARATIVE POWER COSTS BREAK DOWN AS FOLLOWS IN 1976 FRANCS PER KW HOUR: FOR LWR'S, CAPITAL 0.038 TO 0.040, OPERATING 0.018 TO 0.020, AND FUEL CYCLE 0.022 TO 0.024, FOR TOTAL COSTS BRACKETED AT 0.078 TO 0.084; FOR LMFBR'S, 0.048 TO 0.054 CAPITAL, 0.018 TO 0.020 OPERATING, AND 0.009 TO 0.012 FUEL CYCLE, FOR TOTAL COSTS BRACKETED AT 0.075 TO 0.086.

3. COST OF PHENIX PLANT, INCLUDING FUEL COSTS, IN 1974 FRANCS (EXCLUDING INTEREST ON CONSTRUCTION AND TAXES, WHICH CEA DOES NOT PAY) WAS 1 BILLION FRANCS (OR IF 1974 FRANC IS TAKEN AT 4.25 FRANCS PER DOLLAR, ABOUT \$235 MILLION). THIS COST OVERRAN THE INITIAL ESTIMATE MADE IN 1968 BY 10 PERCENT IF CONSIDERED IN CONSTANT 1968 FRANCS. (THE OVERRUN WAS CONSIDERABLY HIGHER IN TERMS OF CUMULATIVE EXPENDITURES IN FRANCS INFLATING OVER THE CONSTRUCTION PERIOD.)

4. PRESENT ESTIMATE FOR SUPER-PHENIX (FOR WHICH POURING OF CONCRETE FOUNDATION IS BEGINNING) IS 4.5 BILLION FRANCS, INCLUDING 5 PERCENT CONTINGENCY. WITH TAXES AND CONSTRUCTION INTEREST THIS BECOMES 6 BILLION FRANCS (1976 FRANCS, WHICH AT 4.5 FRANCS PER DOLLAR, WOULD BE ABOUT \$1.33 BILLION). THE FRENCH ESTIMATE THIS ABOUT 2 TO 2.2 TIMES HIGHER COST

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THAN THE COST OF AN EQUIVALENT COMMERCIAL LWR IN FRANCE AND ABOUT 1.5 TO 1.6 TIMES HIGHER THAN THE COST OF AN EQUIVALENT COMMERCIAL LWR TO BE BUILT IN GERMANY. REPORTEDLY FRENCH LWR COSTS ARE LOWER CHIEFLY BECAUSE ALL THEIR PLANTS OF ONE SIZE ARE TO BE THE SAME, AND EDF ASSUMES SOME RISKS, WHEREAS GERMAN UTILITIES LIKE TURNKEY PLANTS, WHICH CARRY GREATER CONTINGENCIES.

5. CEA STAFF BELIEVES THAT THE COST OF THE SECOND SUPER-PHENIX WOULD BE 25 PERCENT LESS THAN OF THE FIRST. IN ADDITION, SUBSEQUENT COMMERCIAL PLANTS WOULD BENEFIT FROM IMPROVEMENTS AND SAVINGS DUE TO ORDERING OF A NUMBER OF SAME PLANTS. WHEN FURTHER CONSIDERING THAT THE NUCLEAR STEAM SUPPLY SYSTEM OF SUPER-PHENIX ACCOUNTS FOR ONLY A PART OF THE TOTAL COSTS (43 PERCENT), THEY BELIEVE THAT THEIR LONG-RANGE ASSUMPTION OF 30 PERCENT OR LESS INCREMENTAL CAPITAL UNCLASSIFIED

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COSTS FOR A COMMERCIAL LMFBR OVER A COMMERCIAL LWR IS NOT OVERLY OPTIMISTIC. THEY STATE THAT THEIR COMPARATIVE ANALYSES OF EARLY LWR COSTS SUPPORT THIS.

6. CEA'S LATEST THINKING IS ALSO THAT OPERATING COSTS OF LMFBR'S MIGHT BE LESS THAN FOR LWR'S (RATHER THAN THE SAME AS INDICATED BY FIGURES OF PARA 2 ABOVE). THIS IS BASED ON THE PHENIX EXPERIENCE, INCLUDING THE CURRENT REPAIR EFFORT ON THE INTERMEDIATE HEAT EXCHANGER, AND THEIR OPERATING EXPERIENCE AND MAINTENANCE OPERATIONS CARRIED OUT AT THE LWR SENA PLANT.

7. THE ABOVE DATA ARE BASED ON INFORMATION IN OUR OFFICE FILES, INCLUDING "ENERGIE NUCLEAIRE" BY L. THIRIET, GUNOD, OCTOBER 1976, AND DISCUSSIONS RELATING TO THE FRENCH LMFBR PROGRAM WITH CEA TECHNICAL STAFF ON MARCH 24, 1977.
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Message Attributes

Automatic Decaptioning: X
Capture Date: 01-Jan-1994 12:00:00 am
Channel Indicators: n/a
Current Classification: UNCLASSIFIED
Concepts: ENERGY, URANIUM, SALES, PROGRAMS (PROJECTS), NUCLEAR POWER PLANTS
Control Number: n/a
Copy: SINGLE
Sent Date: 25-Mar-1977 12:00:00 am
Decaption Date: 01-Jan-1960 12:00:00 am
Decaption Note:
Disposition Action: n/a
Disposition Approved on Date:
Disposition Case Number: n/a
Disposition Comment:
Disposition Date: 01-Jan-1960 12:00:00 am
Disposition Event:
Disposition History: n/a
Disposition Reason:
Disposition Remarks:
Document Number: 1977PARIS08797
Document Source: CORE
Document Unique ID: 00
Drafter: n/a
Enclosure: n/a
Executive Order: N/A
Errors: N/A
Expiration:
Film Number: D770102-1181
Format: TEL
From: PARIS
Handling Restrictions: n/a
Image Path:
ISecure: 1
Legacy Key: link1977/newtext/t19770322/aaaaasht.tel
Line Count: 163
Litigation Code IDs:
Litigation Codes:
Litigation History:
Locator: TEXT ON-LINE, ON MICROFILM
Message ID: ac35d0b1-c288-dd11-92da-001cc4696bcc
Office: ACTION OES
Original Classification: UNCLASSIFIED
Original Handling Restrictions: n/a
Original Previous Classification: n/a
Original Previous Handling Restrictions: n/a
Page Count: 3
Previous Channel Indicators: n/a
Previous Classification: n/a
Previous Handling Restrictions: n/a
Reference: 77 STATE 59863
Retention: 0
Review Action: RELEASED, APPROVED
Review Content Flags:
Review Date: 01-Oct-2004 12:00:00 am
Review Event:
Review Exemptions: n/a
Review Media Identifier:
Review Release Date: n/a
Review Release Event: n/a
Review Transfer Date:
Review Withdrawn Fields: n/a
SAS ID: 2996314
Secure: OPEN
Status: NATIVE
Subject: LMFBR/LWR POWER COSTS
TAGS: TECH, ENRG, FR
To: ERDA
Type: TE
vdkgvwkey: odbcr://SAS/SAS.dbo.SAS_Docs/ac35d0b1-c288-dd11-92da-001cc4696bcc
Review Markings:
Margaret P. Grafeld
Declassified/Released
US Department of State
EO Systematic Review
22 May 2009
Markings: Margaret P. Grafeld Declassified/Released US Department of State EO Systematic Review 22 May 2009